



Prescriptive Duct Sealing Specification

Last updated: April 8, 2014

1. **Applicability:** This specification outlines the requirements for prescriptively repairing and sealing new or existing ductwork in existing single family homes and existing manufactured homes, heated with an electric forced air furnace or a heat pump.
 - 1.1. At least 30% of the supply ducts must be located in a space that is not conditioned and is accessible.
[Exception: Where high operating pressure leaks are located in an unconditioned space, the system shall be eligible for duct sealing, even if less than 30% of the total duct system is in unconditioned space. A high operating pressure leak is defined as any leak occurring on the main trunk line within 15 feet of the furnace, especially those at the furnace or plenum connection.]
 - 1.1.1. For new duct systems, the entire duct system is considered to be accessible.
 - 1.1.2. Ducts in basements are considered to be in conditioned space; while vented crawlspaces, attics with floor insulation, and unheated garages are considered unconditioned.
 - 1.1.3. The inner liner on manufactured home crossover ducts is considered accessible; while all other flexible duct connections, including those on single family houses that have properly secured exterior liners may be considered to have interior liners that are not accessible.
 - 1.1.4. The belly of manufactured homes is considered accessible if a visual inspection via non-intrusive methods (mirrors, digital cameras etc.) identifies large holes/leaks.
 - 1.1.5. The furnace to plenum connection is considered accessible.
 - 1.2. The presence of insulation alone shall not be considered a barrier to accessibility, unless the contractor suspects asbestos may be present. If at any time asbestos is suspected to be present, the contractor shall stop work immediately and notify the homeowner that the site requires professional assessment, and possibly remediation, before duct sealing work can be done.
 - 1.3. Ducts must not have been previously sealed through the Performance Tested Comfort Systems® or BPA's Prescriptive Duct Sealing program unless a utility pre-inspection confirms that additional duct sealing is required.
2. **Implementation Standards**
 - 2.1. Installation must comply with all applicable codes.
3. **Duct Repair**
 - 3.1. All accessible portions of the duct system shall be repaired and mechanically fastened, where needed.
 - 3.2. Inferior sections of duct—such as rusted, crushed, disconnected or sections otherwise ineffective—shall be repaired or replaced before duct sealing is performed.
 - 3.3. When there are large gaps in sheet metal or duct connections, repairs shall be made using sheet metal, sheet metal screws, and/or mastic and mesh-reinforcing tape. Gaps greater than 1/4" shall be reinforced using mesh-reinforcing tape before applying mastic.
 - 3.4. All metal ducts shall be secured using at least three sheet metal screws at each connection and an attempt be made to have them be equally distributed around the ducts.
 - 3.5. All flexible ducts shall be joined to a section of rigid duct of matching diameter, including locations where two separate sections of flex duct meet. Both the inner and outer lining shall be tightly fastened using a compression strap tightened with a tool designed for that purpose. Tape may remain as long as a compression strap is installed to maintain a permanent connection.
 - 3.6. In manufactured homes with two or more sections, defective or missing cross-over ducts shall be repaired or replaced.



4. Duct Support

- 4.1. All accessible portions of the duct system which require support shall be supported.
- 4.2. To minimize the possibility of disconnection, flexible ducts shall be supported every 4 feet and within 3 feet of each connection to a hard duct, with straps that are not less than 1.5 inches wide each and that do not restrict airflow.
- 4.3. Ducts shall be supported above the ground. When contact with the ground is unavoidable, a minimum of R-4 closed-cell rigid insulation shall be placed between the duct and the ground. This duct shall not come in contact with ground water.

5. Duct Sealing and Acceptable Materials

- 5.1. All accessible portions of the duct which require sealing shall be exposed and sealed with approved materials. The following are examples of sealing opportunities: Plenum; Air-handler cabinet to plenum; Plenum-to-take-off connections; Finger/dovetail joints; Branch T's, Y's and L's; Supply and Return Boots; Duct-to-duct connections; Gores on adjustable elbows; and end caps.
- 5.2. Loose tape shall be removed from rigid ducts prior to sealing. Secured tape that remains must be completely covered with mastic which shall extend at least ½ inch beyond the tape edge on either side and be at least 1/8 inch thick.
- 5.3. Non-flex duct joints, connections and seams shall be sealed with UL-181 listed mastic.
 - 5.3.1. The application of mastic shall be done properly, according to manufacturer specifications.
 - 5.3.2. Take offs and crimped fitted joints shall be mechanically secured with screws and sealed with mastic. Non-leaking seams such as S-drive, snappies and other means of mechanical fastening will be exempt from being sealed with mastic.
 - 5.3.3. On the air handler, only foil or mastic HVAC tape labeled as meeting UL-181 standards may be used.
 - 5.3.4. Cloth-backed duct tape shall not be used to seal, secure, or fasten ducts.
 - 5.3.5. Boots shall be mechanically fastened to the subfloor and properly sealed with UL-181 mastic or UL-181 sealant.
- 5.4. Flexible duct connections shall have the interior and exterior liners secured and air-sealed with nylon straps (Panduit or equivalent) and tightened with a manufacturer-approved tensioning tool. Steel band clamps with worm drive tension adjusters also are acceptable.
- 5.5. The return should be sealed if it is easily accessible and in unconditioned space. Installers are not required to build a ducted return when none exists.
- 5.6. End caps must be made of either sheet metal or a UL-181 approved rigid product.

6. Insulation

- 6.1. Where duct insulation is removed, the insulation shall be re-installed and securely attached to the duct system. Mastic will not effectively hold insulation in place.

7. Combustion Appliance Requirements (Does not apply if there is no combustion appliance)

- 7.1. Whenever there is a Combustion Appliance present in the house, garage, or other attached space, a UL listed, C-UL listed, or equivalent carbon monoxide alarm shall be installed.